

# Macro-economic development and transportation:

Dynamisms of today towards 2050

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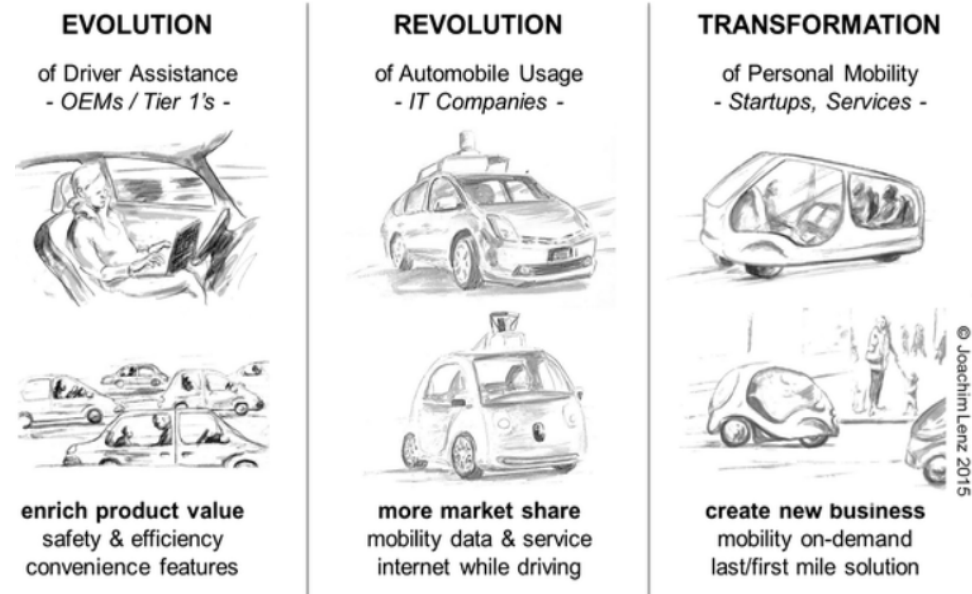


Wissen für Morgen



# Future transportation in the light of the current Kondratieff wave

- Automation of vehicles
- Mobility as a Service (MaaS)
- (Electric mobility)



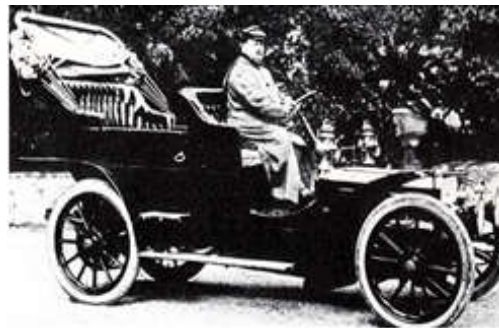
Source: Fraedrich E. and Lenz B. (2016): Societal and Individual Acceptance of Autonomous Driving  
In: Autonomous Driving: Technical, Legal and Social Aspects. Springer Vieweg

- On the contrary





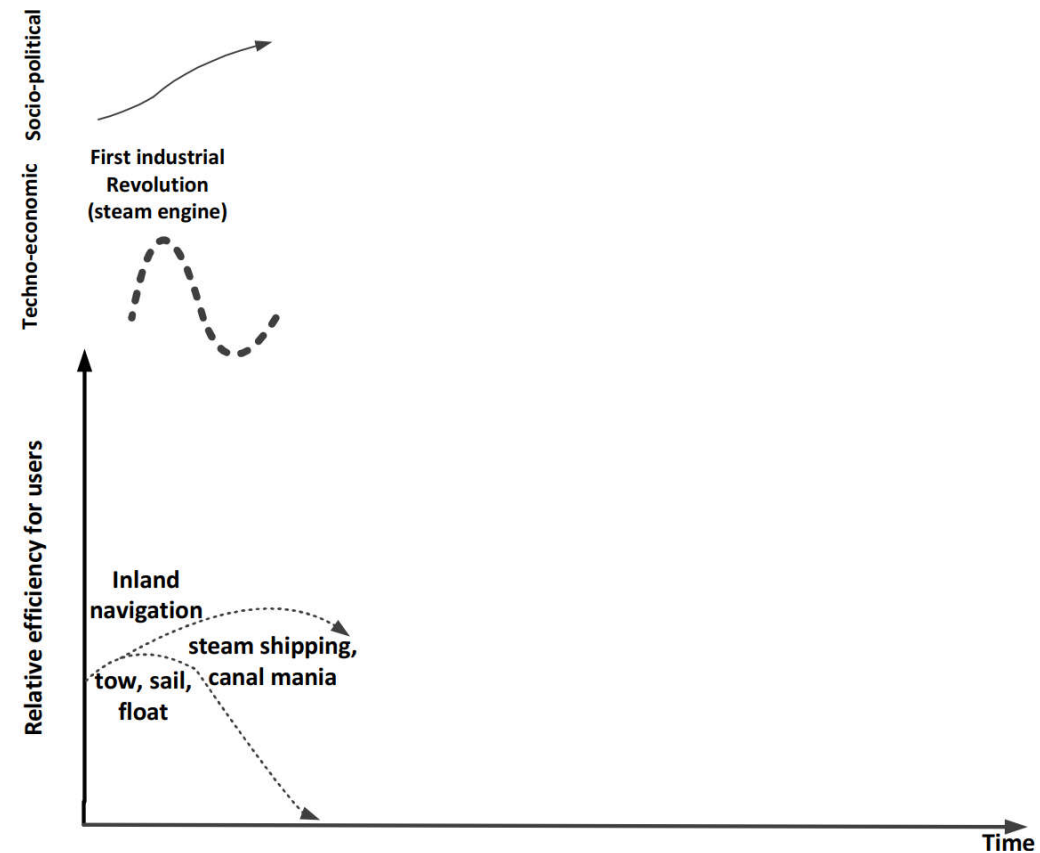
**How could the „mighty railways“ be challenged by the „horseless carriages“?**





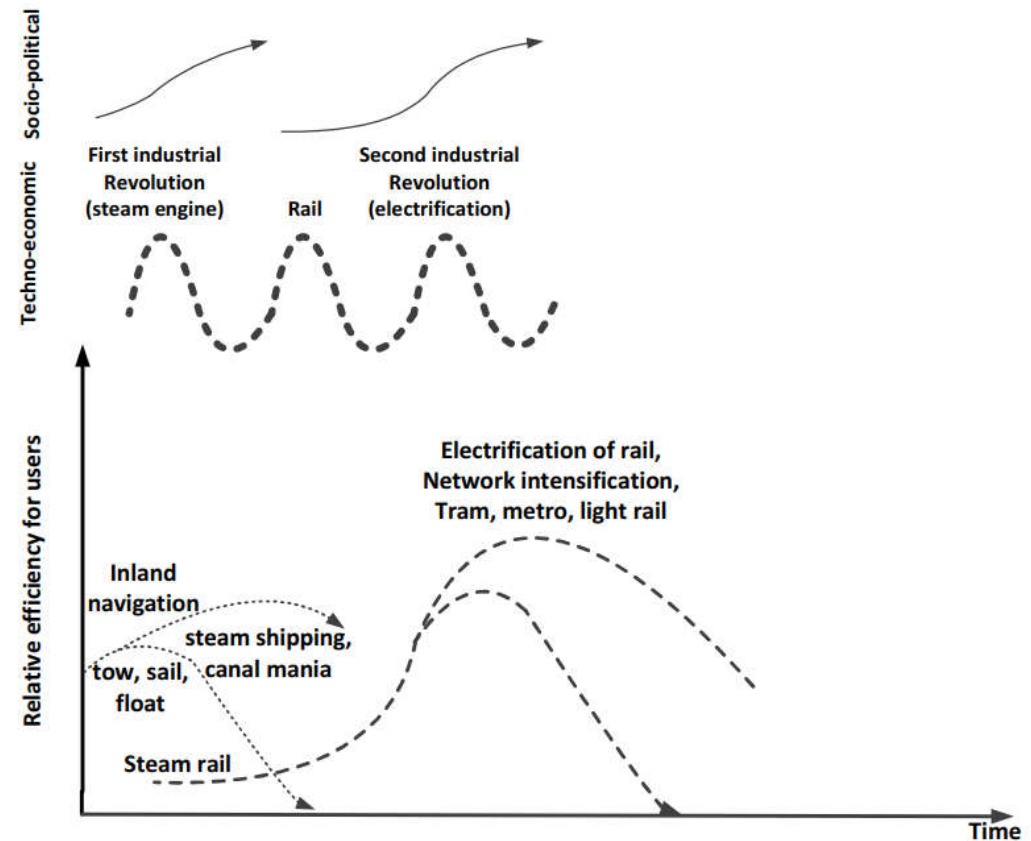
# Transport systems and macro-development trends

- Techno-economic pressure
  - Mass product distribution
  - Speed, spatial access, mass efficiency/transport costs
- Socio-political pressure
  - Urbanization and industrialization only possible at rivers/canals



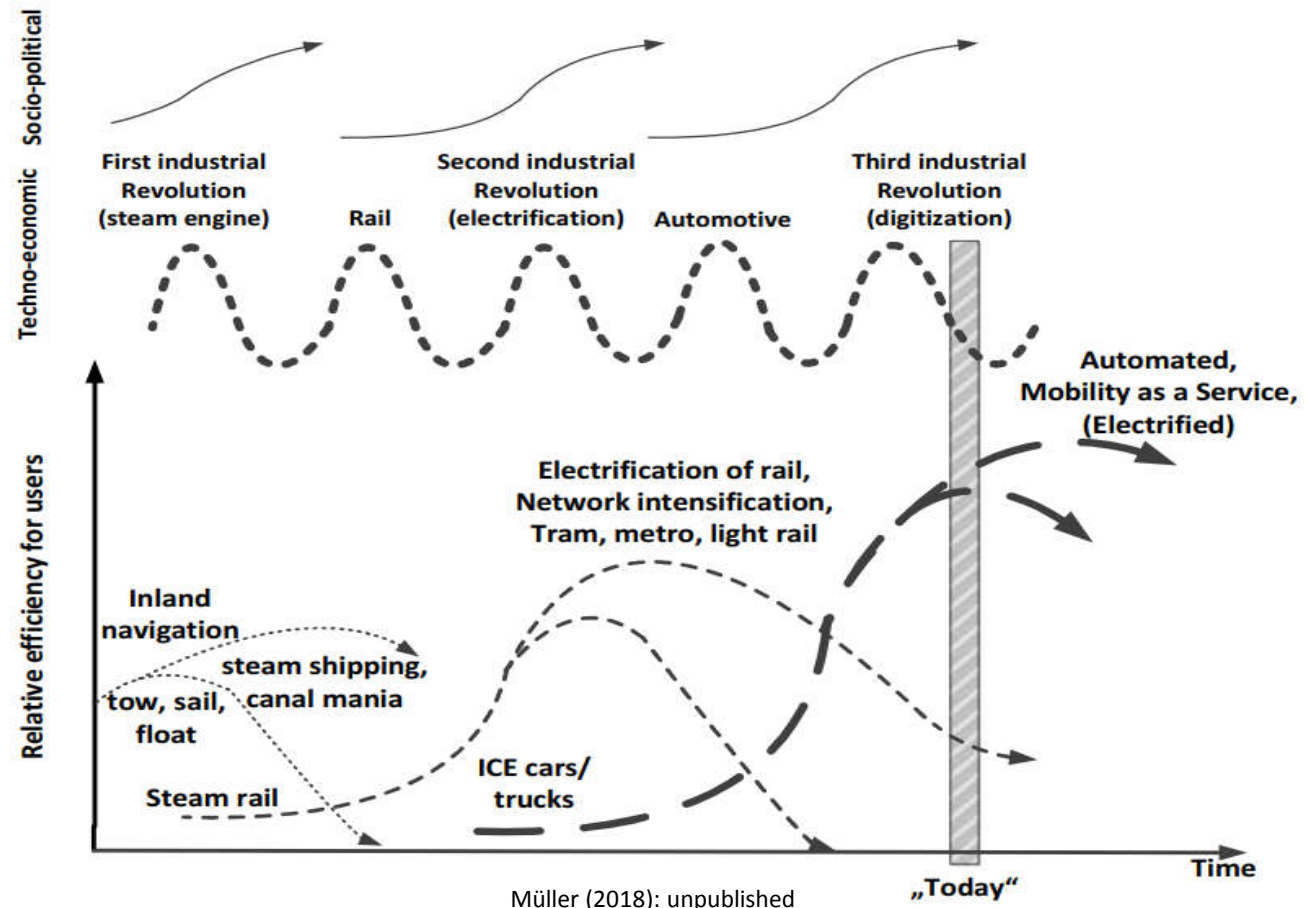
# Transport systems and macro-development trends

- Techno-economic pressure
  - Production independent from local coal availability (electricity)
  - Division of labor production (mass efficiency losing in relevance)
  - Speed, spatial access
- Socio-political pressure
  - Urbanization and industrialization only possible at rail tracks
  - Steam, dirt, noise in cities
  - Growth of population and individual wealth



## Transport systems and macro-development trends

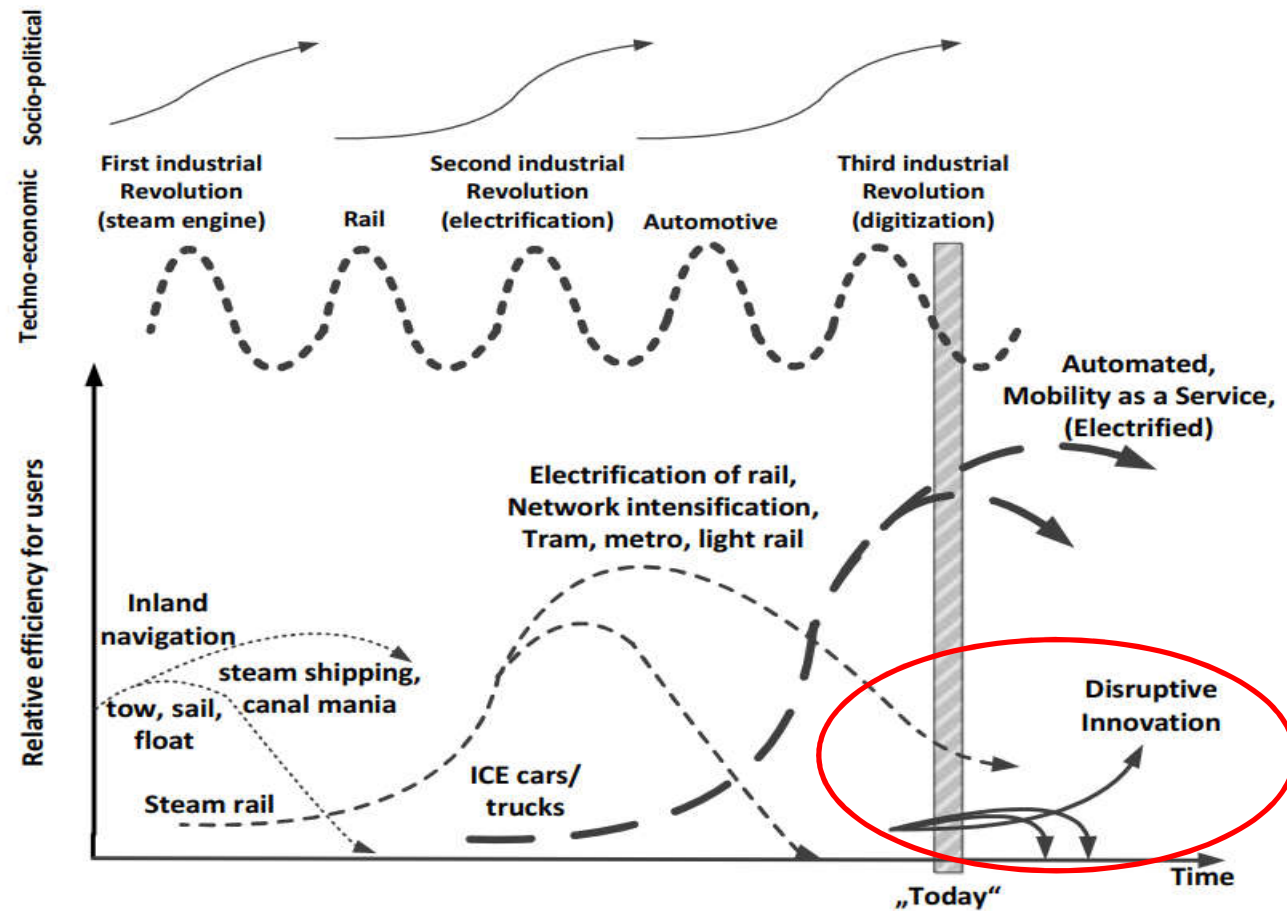
- Techno-economic pressure
  - Global sourcing production
  - Individual products, small units
  - eCommerce/ last mile efficiency
- Socio-political pressure
  - Emission, congestion, noise in cities
  - Ressource scarcity awareness
  - Urbanization and mega-cities



# Macro-economic development towards 2050 ...and transportation

It is not the similarity but the systematics:

- Automated, (electrified) MaaS:
  - Incremental intensification but no „solution“ against pressure
- Disruptive transport technologie in the niche adressing pressure (Hyperloop, airborne drones, others)
  - Digital production system and society requires on-demand, time-space instant and eco transportation



Müller S. (2018): unpublished

# Thank you!

In **1864** the head of the Prussian Statistical Office) wrote to plans to nationalize railways:

“By the way, who can tell where the railways will be in 100 years, and whether they will not be completely devalued by new inventions? What would the railways be worth, if, for example, you would find the means using the steam engine on the highways to work with the same power and speed as on the railways?” (literally)

Engels (1864); Grenzen des Erfindungsgeistes im Transportwesen (literally: Limits of the spirit of invention in transportation)  
First published In: Zeitschrift des Königlich Preussischen Statistischen Bureaus. Reprinted in "WISTA – Wirtschaft und Statistik", Juni 2008

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